The Effect of Cognitive Behavior Modification Program on Stress among Caregivers of Older Adults with Dementia

นิพนธ์ต้นฉบับ

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Original Article

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บทคัดย่อ

วัตถุประสงค์: การวิจัยกึ่งทดลองแบบสองกลุ่มวัดซ้ำเพื่อศึกษาผลของโปรแกรมการปรับพฤติกรรมและปัญญาต่อความเครียดของผู้ดูแลผู้สูงอายุที่มีภาวะสมองเสื่อม **วิธีการศึกษา:** กลุ่มตัวอย่างเป็นผู้ดูแลของผู้สูงอายุที่มีภาวะสมองเสื่อมที่อาศัยอยู่ในจังหวัดชลบุรีที่มีระดับความเครียดตั้งแต่ระดับเล็กน้อยถึงปานกลาง จำนวน 30 คน สุ่มเข้ากลุ่มทดลองและกลุ่มควบคุม กลุ่มละ 15 คน กลุ่มทดลองได้รับการฝึกโปรแกรมการปรับพฤติกรรมและปัญญาเป็นเวลา 8 สัปดาห์ ส่วนกลุ่มควบคุมได้รับการดูแลตามปกติ เครื่องมือที่ใช้ในการวิจัยประกอบด้วย 1) โปรแกรมการปรับพฤติกรรมและปัญญา 2) แบบบันทึกข้อมูลทั่วไปทั้งของผู้ดูแลและของผู้สูงอายุที่มีภาวะสมองเสื่อม และ 3) แบบวัดความเครียดในผู้ดูแลผู้สูงอายุที่มีภาวะสมองเสื่อม วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา สถิติการทดสอบค่าที วิเคราะห์ความแปรปรวนแบบวัดซ้ำ และการเปรียบเทียบรายคู่ด้วยวิธีนิวแมน-คูลส์ **ผลการศึกษา:** คะแนนเฉลี่ยความเครียดในกลุ่มทดลองและกลุ่มควบคุมในระยะหลังการทดลองและระยะติดตามผล 1 เดือน แตกต่างกันอย่างมีนัยสำคัญทางสถิติ ($P < 0.05$) ในกลุ่มทดลองพบว่า คะแนนเฉลี่ยความเครียดก่อนการทดลอง (56.73 ± 1.60) ต่างจากหลังการทดลอง (42.73 ± 2.06) และระยะติดตามผล 1 เดือน (41.00 ± 1.86) แตกต่างกันอย่างมีนัยสำคัญทางสถิติ ($P < 0.05$) ส่วนคะแนนหลังการทดลองและระยะติดตามผล 1 เดือนไม่ต่างกันทางสถิติ **สรุป:** โปรแกรมการปรับพฤติกรรมและปัญญาช่วยลดความเครียดในผู้ดูแลของผู้สูงอายุที่มีภาวะสมอง ดังนั้นบุคลากรทางสุขภาพที่เกี่ยวข้องสามารถเรียนรู้และนำโปรแกรมไปประยุกต์ใช้ เพื่อส่งเสริมสุขภาพจิตของผู้ดูแลเหล่านี้ต่อไป

คำสำคัญ: ความเครียด, ผู้สูงอายุ, ภาวะสมองเสื่อม, ผู้ดูแล, โปรแกรมการปรับพฤติกรรมและปัญญา

Abstract

Objective: This quasi-experimental study aimed to examine the effect of the cognitive behavior modification program on stress, among caregivers of older adults with dementia. **Method:** Thirty caregivers living in Chonburi, Thailand, were randomly assigned equally to either experimental, or control groups. The experimental group received the cognitive behavior modification training program for 8 weeks, while the control group received usual care. Research instruments consisted of 1) cognitive behavior modification program, 2) demographic data collection form for both caregivers and their elderly, and 3) stress questionnaire for caregivers. Data were analyzed using descriptive statistics, independent t-tests, analysis of variance with repeated measures, and pairwise comparison for mean difference using Newman-Keuls method. **Results:** The mean stress scores in the experimental and control groups at post-test and the one-month follow-up, were significantly different ($P < 0.05$). In the experimental group, the mean stress scores at pre-test (56.73 ± 1.60) were significantly different from the mean scores at post-test (42.73 ± 2.06) and the one-month follow-up (41.00 ± 1.86) ($P < 0.05$). However, the mean scores at post-test and follow-up were not significantly different. **Conclusion**: The cognitive behavior modification program could reduce stress among the caregivers of older adults with dementia. Therefore, relevant health care providers could learn and apply this program to promote mental health among the caregivers of older adults with dementia.

Keywords: stress, older adults, dementia, caregivers, cognitive behavior modification program

Introduction

Dementia is a syndrome which can occur in people of both genders and is frequently found in the elderly. The risk of developing dementia is higher with advanced age. The World Health Organization has predicted that in the year 2017, dementia in the elderly will be a major public health problem, second only to heart disease.[1] The health organizations in Europe and the United States have indicated that the prevalence of dementia will be double every 5 years among the elderly aged 65 years and over.[2] With the increase in the number of elderly people, the incidence of dementia is also higher. In Thailand, the incidence of dementia in the population aged 60 and over accounted for 11.4 percent.[3] Dementia is characterized by impairment of memory and intelligence, and change of personality and mood. Judgment and logical decision making, and general behavior also show impairment. Cognitive abilities also decline and this has impact on individual work and interpersonal relationships.

Caregivers are the people who have an important role in providing care for the patients, especially for the elderly with dementia. Since providing care for the older adults with dementia could be regarded as hard work, this has an impact on the caregivers in many aspects, including physical, psychological, and social aspects. These included the caregivers' economic loss in terms of treatment costs for their elderly patients, and their own direct income loss.

It can be said that providing care for older people with dementia is harder in comparison with providing care for the elderly with other chronic diseases. The reasons are that the elderly with dementia usually have declines in their abilities to perform the activities of daily living, have communication impairments, and have problems in their behaviors. This means that the caregivers have to spend a lot more time to provide care for the elderly. Providing care for the elderly with dementia is quite hard for the caregivers, so it makes the caregivers feel overwhelmed, tired, guilty, feelings of low self-esteem and loss independence in living their lives. They also face financial difficulties, stress, and a decrease in their sense of well-being.[4,5]

Blendin and colleagues conducted a study by interviewing 24 daughters who had to take care of their parents who suffered from dementia.[4] These daughters had an age range of 35 - 52 years old. Among them, 16 were married. The purpose of this interview was to assess the caregivers' characteristics, emotional expression, stress, and coping styles. The results showed that 14 daughters had high emotional expression and stress, and ineffective coping styles. Apart from this, these daughters also informed the interviewer that the major problems for them in providing care for their parents with dementia, were related to their parents' Behavioral and Psychological Symptoms of Dementia (BPSD) such as tautological behaviors, eating behavior, and aggressive behavior, etc. In addition, the study of Clipp and George found that 30% of the caregivers took psychiatric medications.[6] Thus, the caregivers are vulnerable to stress, as well as other mental health problems. Therefore, the caregivers, especially those who provide care for older adults with dementia, deserve more attention and monitoring.

The Cognitive Behavior Modification program is one of the therapeutic programs that helps prevent and reduce stress as a result of providing care for the older adults with dementia. The Cognitive Behavior Modification program in the form of "stress inoculation training" was used in this study. This program was developed based on the concept postulated by Meichenbaum[7,8] and from related literatures such as the studies aiming at testing the effectiveness of the Cognitive Behavior Modification program on stress of people with diabetes mellitus[9] and for patients with schizophrenia.[10] The Cognitive Behavior Modification was effective in enabling trainees to reduce their stress and enhance their skills in coping with stress. In Thailand, there has been no study focusing on testing the effectiveness of this cognitive behavior modification program in the form of "stress inoculation training" among the caregivers of elderly people with dementia. We expected that the effectiveness of this program towards stress among these particular caregivers would lead to an improvement for quality of care and quality of life of both the caregivers and their care recipients.

Regarding the **objectives**, this present study aimed to test the effectiveness of the Cognitive Behavior Modification program on stress among caregivers of elder patients with dementia. **Specifically, the study was conducted to** 1) compare stress of caregivers of older people with dementia between the experiment and control groups at post-test, and 1 month follow-up, and 2) compare stress of caregivers of older adults with dementia within the experiment group at pre-test, post-test, and 1 month follow-up phases. According to the specific objectives, **study hypotheses** were as follows. Firstly, there was an interaction between methods (interventions) and time on stress scores. Secondly, the average stress scores of caregivers of elderly patients with dementia in the experimental group at post-test and 1 month follow-up phases were less than those in the control group. Thirdly, the caregivers of older adults with dementia in the experimental group had average stress scores at post-test and follow-up phases less than that at pre-test. Fourthly, the caregivers of older adults with dementia in the experimental group had average stress scores at post-test that were lower than that at pre-test, and were not different from that at follow-up.

In our study, we defined **the Cognitive Behavior Modification program** as activities that were systematically developed based on the concept of cognitive behavioral therapy in the form of "Stress Inoculation Training" and from reviewing relevant literatures. This program was used to train the caregivers of older adults with dementia in order to promote these caregivers' physical and psychological well-

being, by enabling them to have proper management of stress. The activities in this program were divided into three phases as further described in the research conceptual framework. **Stress** was defined as the caregivers' feelings of pressure and distress due to the psychologically that these caregivers have on a daily basis, relevant to providing care for the elderly with dementia. Stress in this study was measured using the caregivers' stress scale developed by Chalasonthi.[11] **Caregivers of older adults with dementia** were defined as the particular people who took major roles in providing care for the elderly patients with dementia at home, without any payment for their care, and had mild to moderate stress scores. Finally, **dementia** referred to the impairment condition of the elderly with diminished abilities of the brain to act on the cognitive process in relation to registration, recognition, attention, calculation, and recall. Dementia condition was assessed using the Thai Mental State Exam or TMSE developed by Train the Brain forum.[12]

In terms of the research **conceptual framework**, the therapeutic intervention program in this study used an approach to modify thought and behaviors called "stress inoculation training" which was based on the concept that stress is somehow associated with misconceptions towards the stressors or stimuli that the individual had.[13] The goal of this program was to enhance the caregivers' potential in managing inappropriate thoughts and behaviors and also be able to apply skills acquired across times and situations. The activities of this program were divided into three phases as follows. In phase I, building relationships and conceptualization was used to promote relationships between the program's trainer and trainees, provide psycho-education towards stress, promote better understanding about the nature of the caregivers own stress, and its impacts. In addition, creating a supportive atmosphere for sharing among the program members with regards to their beliefs and attitude towards stress.

Phase II emphasized educating and enhancing caregivers' skills. The participants would acquire knowledge and enhancement of their cognitive and behavioral skills. Participants would learn various techniques relating to stress reduction such as self–talk, cognitive and behavioral modification, muscle relaxation, and breathing exercises. Participants in the experiment group practiced these skills to achieve proficiency before applying them to their real life situations.

Phase III emphasized applying skills for coping and managing stress, especially when confronting stress in real life situations, through the use of imagination and simulated situations. Once the participants had experiences in managing stress in simulated situations, this would enable them to enhance their skills, and build up their self-confidence in using techniques. This was based on the concept that in order to enhance individuals coping with stress and to prevent them from easily being stressed out, it would be better to let them have stress experiences in advance, with more likely stimuli that these caregivers possibly have in a real life situation. So, in the context of these caregivers, stressors would be in the provision of care for the elderly patients with dementia. By gradually allowing these caregivers to learn and develop skills in dealing with stress. This can be implied as giving these caregivers' "immunization" for illness resistance. Prior to learning and practicing skills in this program, the caregivers might have poor skills in dealing with stress, which is like having low immunity. By enhancing the caregivers' skills, meaning, making them immune to help them cope and manage stress effectively.

Methods

This was a quasi-experimental study with a repeated measures design aiming at testing the effectiveness of the cognitive behavioral modification program on stress among the caregivers of older adults with dementia.

Population and Sample

Population in this study encompassed caregivers of older adults with dementia residing in Phanat Nikhom sub-district, Chon Buri province. The older adults who were taken care of by the caregivers were screened for dementia using the Thai Mental State examination [TMSE]. Those with scores of TMSE below 23 are considered having dementia.

The sample in this study included 30 caregivers of older adults with dementia, living at home. Particular caregivers who had mild to moderate stress scores using the caregivers' stress scale were recruited to participate in this study. Inclusion criteria were: 1) being the major caregivers without receiving any payment 2) staying in the same household with the older adults who had dementia 3) having no psychiatric symptoms and illnesses 4) being able to read and write in Thai. The total number of participants was 30. These 30

caregivers who met the inclusion criteria were randomly assigned into either the control or the experimental groups, 15 participants equally. The sample size of this study was based on Burns and Grove (2003)[14] who mentioned that in the experimental study, it should have at least 30 participants, and at least 15 participants in each group.

Data Collection

Data collection was conducted by the researcher and the research assistant who is a registered nurse having experience in providing care for older patients with mental illness. The researcher trained the research assistant in relation to the data collection procedure and how to administer the questionnaires.

Instruments

Instruments used in this research were divided into 2 parts, tools for data collection and the training program for the caregivers.

Instruments for data collection

Questionnaires developed by the researcher were used for gathering data regarding **personal information from both the caregivers and the care recipients**. For the caregivers, we collected their information regarding their gender, age, marital status, relationships between the caregivers and the older adults, duration of providing care for older adults with dementia, occupation, perceived income sufficiency, having others to take care of the elderly with dementia, and the caregivers' illnesses. Data obtained from older adults with dementia who were taken care of by the caregivers, included older adults' gender, age, education background, and their other diseases, apart from dementia.

In addition to demographic data of the caregivers and the elderly with dementia, the **caregivers' stress** was evaluated using the scale developed by Chalasonthi.[11] This scale was based on the stress scale developed by the Thai Mental Health Department and from reviewing the literatures pertinent to this topic. Chalasonthi developed this stress scale particularly for the caregivers of patients with dementia. This stress scale was validated by the experts. It consisted of 24 items containing both positive and negative wording items, the answers ranged from least to the most. Examples of the questions were "You feel that it is hard to take care of your patients," and "You were easily upset even from a small thing." The higher scores, the more stress the caregivers experience. In our study, the scale was tested with 30 caregivers and an acceptable internal consistency reliability was found with a Cronbach's alpha coefficient of 0.80.

The Thai Mental State Examination or TMSE is a test developed by a group called the Train the Brain Forum committee.[12] It is used for screening older persons with dementia. This test has a total score of 30 points, and divided into six parts of 1) orientation, 6 points, 2) registration, 3 points, 3) attention, 5 points, 4) calculation, 3 points, 5) language, 10 points, and 6) recall, 3 points. Since the test is easy to take, only about 10 minutes is required to complete it. It showed acceptable sensitivity and suitability in the Thai context. The TMSE scores of less than 23 are considered having dementia.

The training program

The tool used in training the participants in the experimental group was the Cognitive Behavioral Modification program. This program emphasized on promoting the caregivers of older adults with dementia to have better understanding towards their own stress, its impacts, enhancement of skills to cope and manage with stress and problem solving, how to deal with stress in real life situations and how to apply what they had learned from the program to manage real-life stress.

The Cognitive Behavioral Modification program contained 8 weekly sessions divided into 3 phases, and each session took about 90 minutes to complete. Details are as follows.

Phase 1: building relationships and conceptualization

The major purposes in phase 1 of the program were to build relationships between the trainers, or the therapist, with the caregivers, or the trainee. This phase helped create trust among the participants, encouragement of ventilation, opportunities for the caregivers to gather data and analyze their own problems, promote better understandings of their own nature of stress and how each caregiver and the others responded to stress. Activities in this phase were grouped into two sessions namely session 1 "Caregivers' awareness of their own emotion, and stress" and session 2 "Exploring caregivers' thoughts and feelings towards providing care for the elderly patients with dementia."

Phase 2: Skill acquisition and rehearsal

The purposes of activities provided in the second phase were to train the caregivers in inhibiting negative response to

stress through the use of various stress reduction techniques including the use of self-talk, muscle relaxation, negative thought modification, and breathing exercises. The caregivers practiced all related skills in dealing with stress and with optimal aims that these trained caregivers should be able to apply acquired skills in their daily life. This phase encompassed 3 sessions as follows: session 3 “Breathing exercises,” session 4 “Muscle relaxation,” and session 5 “Training skills for modifying thoughts and self-talk.”

Phase 3: Application and follow-up through

The objectives of the third phase were to provide the caregivers or trainees opportunities to practice based on the simulated situations that the researchers developed in order to train the caregivers to be able to apply what they had learnt from simulations into their real life situations. After simulations, the trainees were evaluated, then joined the mutual group discussion on how they solved the problems or obstacles that they encountered, including comments and suggestions from other members. In this third phase, there were three sessions including session 6 “Practice skills in simulated situation,” session 7 “Applying skills to be used in real life situations and find solutions to solve problems and obstacles that the caregivers might encounter,” and session 8 “Follow-up and evaluation of applying skills in real life situations.”

Before using this program, it was validated by five experts. The program was revised based on the experts’ recommendations. The program was firstly pilot tested with the 5 caregivers of elderly patients with dementia before using with the caregivers in the experimental group.

Human Rights Protection

This research was granted approval from the ethical committee of Burapha University. The researcher explained the study purposes, informed the process of participating in the program, clarified the rights of the participants regarding voluntary participation, no restrictions to the participants, voluntary withdrawal from the program at any time. Data obtained from this study would be presented for academic purposes in overall group data not specific to each participant. Participants were to remain anonymous.

Data analysis

Prior to analysis, the researchers examined the accuracy and completeness of the data. Data were analyzed using a statistics software program. Assumptions for statistical analyses were tested. Descriptive statistics, independent t-test, analysis of variance with repeated measures and Newman-Keuls method for pairwise comparison were used. Significance level was set at $P < 0.05$.

Results

The majority of the caregivers both in the experimental and control groups were female (Table 1). They were in their middle ages with mean ages of 46.93 and 52.87 years, respectively. In terms of their relationship with the elderly, most caregivers were daughters, 80% and 40%, respectively.

Table 1 Demographic data of the caregivers of the older adults with dementia.

Characteristics	Experimental group (n = 15)		Control group (n = 15)	
	N	%	N	%
Gender				
Female	13	86.67	13	86.67
Male	2	13.33	2	13.33
Age (Years)				
20 - 30	1	6.67	1	6.67
31 - 40	5	33.33	0	0
41 - 50	1	6.67	5	33.33
51 - 60	6	40.00	7	46.67
≥ 60	2	13.33	2	13.33
Mean (SD)	46.93 (15.24)		52.87 (10.82)	
Marital status				
Married	8	53.33	11	73.33
Single	4	26.67	3	20.00
Widow	3	20.00	1	6.67
Relationship with the older adult				
Daughter	12	80.00	6	40.00
Son	2	13.33	2	13.33
Wife	1	6.67	3	20.00
Relative	0	0	4	26.67
Duration of providing care (Years)				
1 - 5	7	46.67	5	33.33
6 - 10	8	53.33	8	53.34
≥ 11	0	0	2	13.33
Occupation				
Not working	5	33.33	0	0
Housewife	4	26.67	9	60.00
Employee	5	33.33	1	6.67
Farmer	1	6.67	3	20.00
Others	0	0	2	13.33
Perceived income sufficiency				
Sufficient	15	0	1	6.67
Insufficient		100.00	14	93.33
Having other caregivers				
Yes	0	0	4	26.67
No	15	100.00	11	73.33
Medical illness				
Yes	12	80.00	11	73.33
No	3	20.00	4	26.67

Of all caregivers, 53.33% in the experimental group and 73.33% in the control group were married (Table 1). Most caregivers in both groups reported insufficient income. About

half (46.67%) of the participants in the experimental group and 33.33% in the control group had taken care of the elderly for a duration of 1 to 5 years. Most were sole caregivers with no help from others, 100% and 73.33 %, respectively. The differences of each of the demographic characteristics between the two groups were not statistically significant.

For the older adults with dementia who were taken care of by the caregivers, most of them were female, 73.33% in the experimental group and 66.67% in the control group. The average ages were 74.20 and 74.27 years, respectively. In addition to dementia, the elderly patients also had other medical illnesses such as diabetes mellitus and hypertension, 86.67% and 73.33% in the experimental and control groups, respectively. None of the characteristics were significantly different between the two groups ($P > 0.05$).

Table 2 Demographic data of the older adults with dementia.

Characteristics	Experimental group (n = 15)		Control group (n = 15)	
	N	%	n	%
Gender				
Female	11	73.33	10	66.67
Male	4	26.67	5	33.33
Age (Years)				
60 - 70	6	40.00	5	33.33
71 - 80	7	46.67	7	46.67
≥ 80	2	13.33	3	20.00
Mean (SD)	74.20 (8.11)		74.27 (8.37)	
Other medical illness				
Yes	13	86.67	11	73.33
No	2	13.33	4	26.67

It was found that in the experimental group, the average score of stress among the caregivers decreased from 56.73 points at pre-test, to 42.73 and 41.00 points at post-test and follow-up, respectively. In the control group, in contrast, stress scores increased, from 57.07, to 61.73 and 62.33 points, respectively (Table 3). At pre-test, stress scores of the two groups were not significantly different ($P = 0.89$).

Table 3 Average stress scores of the older adults with dementia at pre-test, post-tests and one-month follow-up.

Times	Experimental group (n = 15)		Control group (n = 15)		*P*-value
	Mean	SD	Mean	SD	
Pre-test	56.73	1.60	57.07	1.61	0.89*
Post-test	42.73	2.06	61.73	2.06	
1-month follow-up	41.00	1.86	62.33	1.85	

* independent t-test

Overall, the average stress scores in the experimental and control groups were significantly different ($F = 31.65$, $P < 0.05$) (Table 4). This means that the difference in treatment or intervention affects the level of stress regardless of the time point of stress measurement. In addition, there was an interaction between methods and time points ($F = 81.84$, $P < 0.05$). This interaction was also visually depicted in Figure 1. This means that while the stress scores among the experimental group decreased over time, those in the control group increased, and these opposite changes were significant.

Table 4 Repeated measure analysis of variance of stress scores among the caregivers of older adults with dementia.

Source of variation	df	SS	MS	F	*P*-value
Between subjects	29	7,791.60			
- Group (G)*	1	4,134.44	4,134.44	31.65	< 0.05
- Ss w/in groups	28	3,657.16	130.61		
Within subjects	60	3,162.00			
- Interval (I)	2	494.87	247.43	20.38	< 0.05
- I x G	2	1,987.22	993.61	81.84	< 0.05
- I x Ss w/in groups	56	679.91	12.14		
Total	89	10,953.60			

* group = experimental group vs. control group

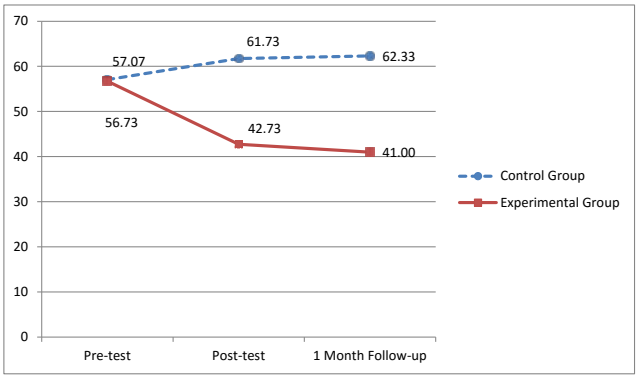

Figure 1 Interaction effect between methods and time-points on stress scores

It was found that among the caregivers in the experimental group, there is at least one pair of times where their stress scores were significantly different ($F = 74.20$, $P < 0.05$). Further, multiple comparisons between each pair of time-points found that scores at post-test and follow-up were both significantly different from pre-test score ($P < 0.05$ for both) (Table 5). On the other hand, no statistically significant difference between scores at post-test and follow-up was found.

Table 5 Pairwise comparisons for stress scores in the experimental group using Newman-Keuls method.

Time-point	Mean	Time-point		
		Pre-test	Post-test	Follow-up
Pre-test	56.73	-	14.00*	15.73*
Post-test	42.73	-	-	1.73
Follow-up	41.00	-	-	-

* $P < 0.05$

Discussions and Conclusion

In this quasi-experimental study, we aimed to test the effectiveness of the Cognitive Behavior Modification program on stress among caregivers of older adults with dementia. The sample consisted of 30 caregivers of older adults with dementia. Thai Mental Status Examination (TMSE) was used to screen and determine whether the patients had dementia. Those elderly patients who had TMSE scores of less than 23 were considered having dementia. The discussions are as follows.

There was an interaction between interventions and time-points of stress evaluations. Interventions included the Cognitive Behavior Modification program as the experimental intervention and usual care as control. We found that was consistent with the research hypothesis that methods (interventions) and time interacted and had influence on stress of the caregivers. The finding was statistically significant that while stress scores in the experimental group decreased, ones in the control group increased.

This interaction could be due not only to the fact that the program was effective, but also the detrimental change in the control group. While those caregivers in the control group receiving only the usual care could end up having constant stress levels over time since they had not had any training to cope with stress. On the contrary, their stress levels went up and made the interaction significant.

The difference in the directions of the stress level could be due to the fact that the caregiver participants in these two groups performed different activities. Specifically, caregivers in the control group merely received usual services from the health care providers; while those in the experimental group received training through the cognitive behavioral modification program. These caregivers learned about stress, its nature and impacts. They had acknowledged their negative thoughts and then modified these thoughts to fit with reality and rationality. They also received skill training which enabled them to have better coping abilities and management of stress. In addition, this program was conducted in groups which opened opportunities for the group members to share their experiences, especially their causes of stress and how they dealt with stress in relation to providing care for the older adults with dementia. The participants in the experimental group also had opportunities to ventilate, exchange knowledge, and support each other within a warm and caring atmosphere. During the training, they also received homework to do on their own at homes which helped them to continuously practice their skills until they became proficient and more confident in applying these skills to deal with stress in their real life situations.

The results from this study were consistent with the study conducted by Jomnongphol and colleagues[10] which tested the effect of the cognitive behavioral modification program on stress among the caregivers of patients with schizophrenia. They also found interaction effects between interventions and times.

The caregivers in the experimental group of this study had average stress scores at post-test and one-month follow-up lower than those in the control group. This was consistent with the study conducted by Makmuang[9] to test the effect of the cognitive behavioral program on stress among the patients with diabetes mellitus. Our results were also consistent with the results in the study conducted by Akkerman and Ostwald[2] where the cognitive behavior modification program had a significant beneficial effect on anxiety among the caregivers of patients with dementia. After the program, these caregivers reported better sleep and less anxiety in comparison with those caregivers in the control group. The effectiveness of the program in reducing stress among the caregivers of elderly patients with dementia could be explained that this program was systemically developed and had clear directions of what the caregivers should be trained in. These caregivers had enhanced their skills in coping and managing stress via the cognitive behavior modification program in the form of “stress inoculation training.” After skill acquisition, the caregivers had opportunities to practice and enhance their skills. Later on, they were able to apply these skills for using in real life by applying the skills to practice on their own. The more they practiced, the more they were confident to deal with stress like they were building immunity to have better resistance to the illnesses.

Among caregivers in the experimental group, the caregivers of older adults with dementia had average scores of stress at post-test and one-month follow-up lower than that at pre-test. In addition to the reasons we elaborated previously on the significant interaction between the interventions and time, the program's beneficial effect was also due to the good cooperation among the trainees.[15,16] In our study, the caregivers in the experimental group cooperated well and paid attention to what they had learned and practiced. At the end of the program, they were able to apply the skill acquisition to use on a daily basis. These made their stress reduce over time. This study results were consistent with the study conducted by Ungamrung[17] where it was found that depression scores at post-test and follow-up phases were lower than at pre-test among the elderly with cervical cancer after the cognitive therapy. The author explained that the reduction of depression among these patients could be that the patients in the experimental group had better adjustment and modification towards their negative thoughts and applied skills acquired to cope with stress, and depression in particular, in their real life.

Stress scores among the caregivers of older adults with dementia in the experimental group at post-test and one-month follow-up were not significantly different. This could mean that this program helped build a sustainable immunity against stress, if not increased, even after the end of the training. This also suggests that the practice after the program for a short period of time, i.e., one month, was feasible. This is consistent with the results of study conducted by Makmuang[11] which showed that in patients with diabetes, the average stress scores at follow-up were not significantly different from that post-test.

This study had few **limitations**. To prove the sustainability of beneficial effects and the feasibility to continue the practice this Cognitive Behavior Modification program, a duration of follow-up longer than one month is needed. In addition, to lessen bias, a larger sample size is recommended.

In terms of **recommendations**, despite few limitations, our findings suggest some practical points for the actual nursing care. Given its effectiveness, it is recommended that this cognitive behavior program in the form of "stress inoculation training" should be applied in preventing and promoting mental health among the caregivers who had psychological distress or chronic diseases. The program could also be extended for mental health promotion among the patients in clinics. Administrators could help promote implementing the program by supporting nursing staff to be skillful in this program. In addition, studies that integrate measurement of physiological variables to identify stress such as muscle tension and body temperature, etc., are recommended. Studies extended to caregivers of the elderly with illnesses other than dementia, for example, diabetes and stroke, etc., are much needed. Furthermore, studies with longer follow-up duration and larger sample sizes are also needed.

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Editorial note
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